



GENDER AND THE SANITATION VALUE CHAIN: A Review of the Evidence

March 2018

This document was written by Alexandra Geertz and Lakshmi Iyer of FSG. Lucero Quiroga (Independent Consultant) and Jennifer McCleary-Sills (Bill & Melinda Gates Foundation) provided technical review and guidance. Additional technical and editorial input was provided by Dipika Ailani, Radu Ban, Jessica Brinton, Sarah Henry, Haley Hill and Alyse Schrecongost of the Gates Foundation.

Cover image: ©Bill & Melinda Gates Foundation/Frederic Courbet

BILL & MELINDA
GATES *foundation*



CONTENTS

Boureima Kabre holds the hose used to empty the septic tank outside of Odette Ouedraogo's home in Ouagadougou, Burkina Faso.
©Bill & Melinda Gates Foundation/Frederic Courbet

Executive Summary	4
Introduction	5
Methodology	6
I. Poor Sanitation and Outcome Disparities	7
II. Gender Differences along the Value Chain	9
III. Gender and its Role in Sanitation Policy	17
IV. Emerging Approaches to Gender Integration in Development	19
V. Conclusion	22

EXECUTIVE SUMMARY

Gender matters in sanitation. Our current understanding of gendered differences in sanitation is limited by a lack of research and sex-disaggregated data. Emerging evidence, however, convincingly shows that gender differences and dynamics along the sanitation value chain can influence people's access to sanitation as well as their health, development, and empowerment, especially for the most vulnerable.

Biological differences between men and women influence what they need from sanitation facilities and how often they use them. But well beyond biological differences, gender—the socially and culturally constructed ideas of what it is to be male or female—plays a significant role in shaping how women, men, girls, and boys access sanitation. Cultural practices, beliefs, and gendered social norms lead to disparities in men's and women's access to sanitation facilities, influence roles and responsibilities in the household, and affect decision-making power in local and national sanitation policies. For example, stigma and misperceptions around menstruation and pregnancy restrict women's use of sanitation facilities, and lack of consultation and engagement of women means that facility design and placement often overlook women's unique needs.

Gender dynamics and power relationships also play a role in sanitation decision-making within the household. Especially after puberty, women may face restrictions on their activities and sanitation access because of social norms and taboos related to menstruation and female sexuality. Anecdotal evidence shows that failing to consider gender differences within the household can lead to unintended consequences that exacerbate these norms. Women also more commonly carry the bulk of the daily burden associated with maintaining sanitation facilities. Though there are limited data on sanitation specifically, findings suggest that engaging women as

decision-makers can lead to improved development outcomes for them and for their families, including some evidence of improved sanitation outcomes.

The decision of where to place public and community sanitation facilities rarely considers gender differences in mobility and privacy needs. Toilet locations can increase women's risk of physical and emotional violence and create a sense of shame and embarrassment. In studies across diverse geographies, women have experienced gender-based violence while urinating or defecating in the open, walking to public toilets, and using sanitation facilities. Multiple studies include reports of women walking long distances or waiting until dark to defecate or urinate so they can have privacy. To avoid being seen or harassed by men, women abstain from eating or drinking, and hold their urine at work so they do not have to use latrines or open defecation sites during daylight. Sanitation solutions that do not take an intentional approach to gender can also be costly for women. Experts argue that pay-per-use latrines may be inequitable for women as they have to use facilities more frequently than men to meet their own and their children's needs.

Though there are still significant gaps in the data, it's clear that gender differences show up at each point along the sanitation value chain, and emerging evidence suggests that women suffer disproportionately negative outcomes as a result. What's more, failure to consider gender differences and address disparities will stymie progress toward reaching UN Sustainable Development Goal 6 to eradicate open defecation and ensure the availability and sustainable management of sanitation for all. Building on existing momentum and meaningfully applying a gender lens across the sanitation value chain can considerably improve sanitation outcomes.

INTRODUCTION

Safe sanitation options are critical for people's improved health and well-being. They also are vital for dignity and human rights. In 2015, the UN Sustainable Development Goals (SDGs) made universal access to sanitation a priority, committing to end open defecation and provide sanitation access to all by 2030, with a specific focus on addressing the needs of women and girls and people in vulnerable situations. The goals seek to increase the proportion of the population using safely managed sanitation and water services, as well as to track the adoption of community engagement in creating and implementing policy. The detailed goals do not specifically call for sex-disaggregated measurements, and current measures of sanitation outcomes rely heavily on household surveys that do not capture usage by individual family members. The result is a missed opportunity for measuring progress toward gender equality in sanitation outcomes. The gender equality indicators under SDG 5 can provide important guidance to practitioners, policymakers, and funders to improve sanitation access for all- and to ensure that improvements in access and usage for women and girls can be accurately tracked.

To date, the sanitation sector has not consistently included a gender lens in its approach to policy development, program execution, and product design. Failure to consider gender differences and potential inequalities that emerge from these differences could stand in the way of achieving sanitation access for all. It could also lead to unintended consequences, especially for the most vulnerable. The gendered roles and expectations can vary across geographies, cultures, classes, and religions, so it is critical that practitioners conduct gender analyses to identify where gender-based

barriers to sanitation exist. However, a lack of sex-disaggregated data and limited gender analyses across the sanitation sector make it challenging to understand exactly where these differences exist along the sanitation value chain. This lack of data also makes it difficult to measure how gender inequality leads to poor outcomes for men and women.

This report is the first in a series of evidence reviews commissioned by the Bill & Melinda Gates Foundation to highlight how gender influences development outcomes across sectors. This report seeks to uncover the evidence on gender differences in the sanitation value chain to show why gender matters across this sector. It includes an assessment of gender differences in sanitation use and maintenance and in participation in the sanitation sector and marketplace. Not all gender differences lead to disparities in outcomes, but this review shows that women do suffer disproportionately negative outcomes compared to men.

This report is based on an analysis of peer-reviewed academic papers; program reports, evaluations, and case studies; white papers; and 'to a limited extent' policy papers, briefings, and opinion papers related to sanitation and gender. It will cover the following areas:

- I. **Poor Sanitation and Outcome Disparities**
- II. **Gender Differences along the Sanitation Value Chain**
- III. **Gender and its Role in Sanitation Policy**
- IV. **Emerging Approaches to Gender Integration in Development**
- V. **Conclusion**

Definitions¹

Gender: The socially and culturally constructed ideas of what it is to be male or female in a specific context.

Gender analysis: A critical and systematic examination of differences in the constraints and opportunities available to an individual or group of individuals based on their gender.

Gender lens: A perspective that pays particular attention to gender differences and relations.

Gender norms: The collectively held expectations and beliefs about how women, men, girls, and boys should behave and interact in specific social settings and during different stages of their lives.

Gender relations: Socially constructed power relations between females and males of all ages.

Sanitation: The access, quality, and use of sanitation facilities (e.g., toilets), maintenance of sanitation facilities, evacuation, transportation, treatment and re-use of fecal sludge and waste water, design of and access to menstrual products, and sanitation and hygiene behavior.

Sex: A person's biological status, which is typically categorized as male, female, or intersex.

A household toilet built as part of a community sanitation project in Badsu village in Himachal Pradesh, northern India. ©Bill & Melinda Gates Foundation/Prashant Panjari



METHODOLOGY

The literature review included over 100 peer-reviewed academic papers; program reports, evaluations, and case studies from non-governmental organizations (NGOs) (e.g., WaterSHED, Mahila Milan); and reports from international NGOs (INGOs) (e.g., WaterAid, Plan International, Save the Children, and Action Contre le Faim) and multilaterals (e.g., UN Women, UNICEF). It also included, to a limited extent, policy papers, briefings, and opinion papers within directly relevant disciplines, such as water, sanitation and hygiene (WASH), gender equality, and health, and indirectly related disciplines, such as veterinary science. These papers also served to identify examples of gender-intentional sanitation interventions.

The authors then assessed the strength of this evidence to identify what is known about the intersection between gender and sanitation and to elevate knowledge gaps that remain. To conduct an objective and balanced assessment, this review considered and outlined the wide-ranging ways that gender and sanitation may intersect along the value chain. There is a growing evidence base on gender differences among sanitation users—including product and usage preferences, facility access, and maintenance. There are limited data on gender differences within the sanitation sector and especially along the fecal sludge value chain. This report has elevated findings based on what is known, but significant information is still needed to make more conclusive claims about how gender influences usage and other outcomes across the sanitation value chain.

I. POOR SANITATION AND OUTCOME DISPARITIES

Despite gaps in evidence and limited access to sex-disaggregated data, there is sufficient evidence to suggest that when women and girls have poor access to sanitation, they bear a greater burden and suffer worse outcomes than men. Biological differences play a role in these disparities, as women have different needs, especially during menstruation and pregnancy and after childbirth. Biological differences, however, do not adequately

explain the disproportionately negative physical and mental health, education, and economic outcomes that women experience. The emerging evidence on outcome disparities between men and women suggests that cultural practices, biases, and social norms are likely influencing factors as well. Table 1 provides a summary of the evidence linking poor sanitation to health and development outcomes for men and women:

Table 1: Poor sanitation access and physical health

Physical Health Outcomes	
Women and girls	<ul style="list-style-type: none"> • Women and girls experience higher rates of infection from poor sanitation conditions and lack of sanitation access. • Evidence from small quantitative studies, primarily from India, shows the link between poor sanitation and urogenital infections (e.g., urinary tract infections).² However, evidence on the link between poor menstrual hygiene and bacterial vaginosis is conflicting.^{3,4} • There is insufficient evidence to corroborate the link between poor sanitation and reproductive tract infections. • Pregnancy & newborn health: Emerging evidence from India is finding that adverse pregnancy outcomes, including pre-term birth, are linked with open defecation practices. • Pregnancy & newborn health: Evidence shows a causal link between mothers' exposure to poor sanitation and infant mortality.⁵⁻⁷
Men and boys	<ul style="list-style-type: none"> • Primary and secondary research (e.g., analysis of national data) indicates childhood diarrhea affects boys as well. • There is no research that specifically explores sanitation and health outcomes unique to boys in adolescence.
Mental Health Outcomes	
Women and girls	<ul style="list-style-type: none"> • Fear of sexual abuse and harassment while engaging in activities outside the home, including using a community toilet, leads to anxiety, stress, and other psychosocial issues.⁸⁻¹⁰ These findings are mostly from small sample studies in South Asia. • Psychosocial stress may also be caused by daily pressures related to mobility, roles and responsibilities, and other social expectations. In a forthcoming study by Caruso et al., a qualitative and quantitative survey with 1,400 women across different life stages found that some of the measures of poor sanitation outcomes were related to ongoing depression, anxiety, stress, and decrease in overall well-being. Fear of being judged, assaulted, or shamed while engaging in sanitation activities outside the house can lead to low levels of consistent stress and compounding physical outcomes over time. Adolescents, for example, can suffer greater physical affects over their lifetime if they experience consistent levels of stress during the formative adolescent years.¹¹⁻¹⁴

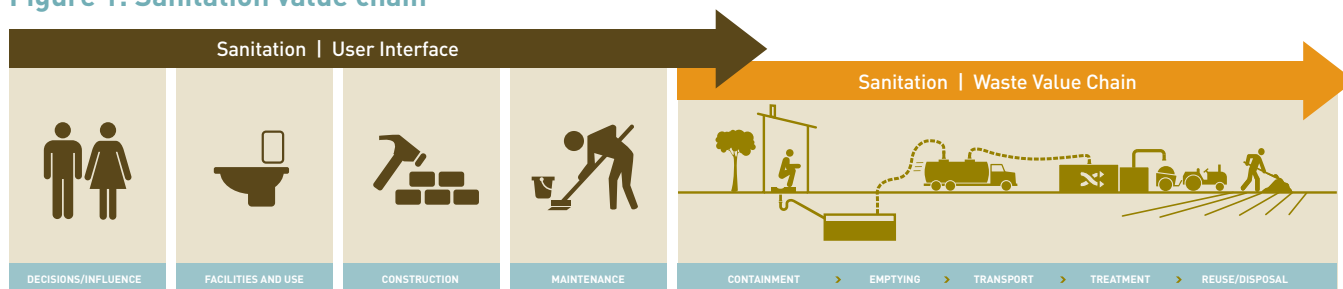
Mental Health Outcomes	
Men and boys	<ul style="list-style-type: none"> • In a small-sample qualitative study in Zambia, men reported shame when seen by family members while accessing public facilities to defecate. • Anecdotal reports from a Bangladesh study show men may experience psychosocial stress from the stigmas of being considered unclean. • Desk-based studies highlight older men feeling shame and humiliation from not reaching a toilet in time and needing to urinate or defecate in the open.
Education Outcomes	
Women and girls	<ul style="list-style-type: none"> • Poor sanitation in school impacts boys and girls, but reports show girls are disproportionately impacted, especially when managing menstruation.^{15,16} • Though studies are inconclusive on the direct quantitative correlation between sanitation and school attendance,¹⁷⁻²⁰ there is sufficient evidence to show that issues related to toilet insecurity and girls' inability to manage menstrual hygiene do contribute to their absences from school or embarrassment at school.²¹⁻²⁵ Lack of separate latrines for boys and girls in schools can deter girls from using the facilities.²⁶ Only 6.9% of girls in Sierra Leone said that their schools had water available in a private area to wash during menstruation.²⁷ • Data on the direct link between menstruation and school absenteeism and/or dropout rates are still inconclusive.²⁸⁻³⁰
Men and boys	<ul style="list-style-type: none"> • Limited evidence shows adolescent boys are impacted by poor sanitation in secondary school, however they are less impacted than girls. Overcrowding in schools has been associated with both boys and girls avoiding toilets. Students avoid using the toilet due to the anxiety of waiting in line during recess or a lack of privacy.³¹ • There is some corroborating evidence linking school sanitation to school absences, though less on school performance. One study examined academic performance as an educational outcome in New York City and found that male and female students' academic success and school attendance were influenced by the conditions of bathrooms in their school.³²
Economic Outcomes	
Women and girls	<ul style="list-style-type: none"> • Most of the current research fails to consider other contributing socioeconomic and household factors, such as lack of economic resources. • Both men and women seem to experience a substantial loss of productive time related to poor sanitation. However, program-related gender analyses suggest that women experience more sanitation-related time poverty than men.^{33,34} • Studies suggest that when women have increased household bargaining power, the household spends more on health, education, and well-being, leading to improved education, health, and nutrition among children, particularly girls.³⁵⁻³⁷
Men	<ul style="list-style-type: none"> • Men take on more formal income-generating roles in the sanitation sector than women, who tend to lack opportunities to join enterprises and/or face discrimination in the sector.

Gender differences also have intergenerational implications on sanitation as well. For example, studies suggest that, on average, women invest more money than men in nutrition, school fees, and other needs of the family. Experts suggest they likely do the same for sanitation facilities, which directly impacts the health and well-being of their families. Similarly, with stigma and norms associated with menstruation, women are subject to restrictions on their mobility within the household, use of facilities, and engagement in social and prayer activities. Adolescent girls and young women are often subject to the same social norms and cultural practices as their mothers.

The disparities in outcomes suggest that there are important gender differences related to sanitation decisions and influences, preferences and use, and roles and responsibilities. The next section explores the state of the evidence and identifies gender differences along the sanitation value chain to better understand the influence of gender on sanitation outcomes and identify barriers related to gender that the field can seek to address to improve outcomes for all.

II. GENDER DIFFERENCES ALONG THE VALUE CHAIN

Figure 1: Sanitation value chain



This section explores gender differences across the sanitation value chain (Figure 1), from the user journey through the fecal sludge value chain. The analysis is intentionally focused on first uncovering where gender differences exist and then assessing whether and how these differences influence sanitation access. There are notable gaps in the evidence, especially across the backend of the value chain, that require further investment and research, but sufficient evidence exists to suggest that gender matters at each point of the value chain.

Sanitation | User Interface

Data collection is commonly carried out at the household level, making it challenging to identify gender differences in preference and use within the household. However, emerging research and programming is starting to show important dynamics between men and women that influence their sanitation preferences, use, and maintenance. Additionally, power dynamics between men and women within the household and in the community at large can limit women's agency, mobility, and decision-making power, which in turn affects her sanitation access. Understanding these diverse experiences is critical to ensuring women and girls have equitable access to sanitation.³⁸

The following sections break down the user journey to show examples of how gender differences can influence (1) people's decisions about their own and others' sanitation access and use, (2) people's preferences for and use of sanitation facilities, and (3) the construction and maintenance of sanitation facilities. Each section provides key insights and examples from the research. Because of evidence gaps and varying situations from place to place, findings from individual studies should not be assumed to be generalizable. However, when taken together, these examples signal the importance of understanding and designing for gender differences at each stage of the user journey to ensure inclusive outcomes across contexts.

1. Decisions and Influence³⁹⁻⁴⁴

Gender dynamics and power relationships can play a role in sanitation decision-making within the household, and one individual can dictate the sanitation access and use for others. However, those in decision-making roles or positions of power are not always aware of the needs of others in their household. This section explores the gender differences in decision-making roles and influence.

Studies suggest that when women have increased household bargaining power, the household spends more on health, education, and well-being. This in turn improves children's—particularly girls'—education, health, and nutrition.⁴⁵⁻⁴⁷ Findings suggest that engaging women as decision-makers could also improve sanitation outcomes for their families, though the data on this are limited. Women are often considered to be in the best position to influence sanitation and hygiene practices because of their socially assigned role as mothers and wives.⁴⁸ Yet, research suggests that men often have more influence over sanitation decisions within the household.

When it comes to sanitation facilities in the home, household studies show that men and women have different drivers for adopting in-home pit latrines. Marriage is a significant driver for men to invest in household latrines across geographies. For example, in Haryana, India, a state where gender inequalities are well documented and married women typically move to their husband's family's house, the No Toilet, No Bride program encouraged families to demand that marriage suitors construct a toilet prior to marriage. While the program resulted in a 15% increase in men investing in sanitation,⁴⁹ critics say that it perpetuates discriminatory norms and restricts women's mobility by suggesting that women must stay at home to be safe.⁵⁰

Women’s increased access to sanitation loans is giving them the opportunity to invest in sanitation solutions that address their menstrual and other needs.⁵³

Data on the affordability of household toilets and people’s willingness to pay for them are limited, but the available evidence suggests that men are more willing to pay than women, and that women inform and influence men’s decisions. Anecdotal examples show that women have a greater need for toilets and play an important role in discussing and convincing men of the potential value of investing in in-home facilities.⁵¹ A handful of studies suggest that men are more willing to pay than women and are less concerned about financial constraints in making these decisions. A study in Vietnam found that men were more willing than women to pay for constructing a bathroom with a flush toilet.⁵²

Men have greater control over household financial decisions, which can influence the choice to invest in sanitation facilities within the home. Anecdotal examples show that men sometimes refuse to invest in improved sanitation for women and the family because of cultural beliefs, misperceptions, or lack of understanding about women’s needs. Below is an example from consumer research conducted by Sanivation, a Kenya-based social enterprise that provides and services container-based toilets for households in urban settings.

When women gain decision-making power in the household, they are better able to access sanitation solutions that will meet their specific needs. Women’s increased access to sanitation loans is giving them the opportunity to invest in sanitation solutions that address their menstrual and other needs.⁵³ Gramalaya, an organization in India that provides affordable sanitation loans to low-income clients, designed its sanitation loans specifically for women, resulting in improved project outcomes. The organization identified that women preferred group loans because they could share the risk and benefits with neighbors. Given household responsibilities and norms, women also preferred the option of having organization representatives collect payments from women in their homes, and the flexibility of being able to send money to the group with their neighbors. Finally, women appreciated that little documentation was required to obtain a loan, which made the process smooth and easy. These efforts resulted in high customer satisfaction and a more than 99% repayment rate.⁵⁴

Case Study

Addressing in-home latrine access for Kenyans

Sanivation, a social enterprise in Kenya, installs container-based toilets in homes for free and charges a nominal monthly fee to service them, offering an alternative to shared pit latrines. The company saw early uptake from clients with disabilities, in part because of the toilet’s convenience and safety.⁵⁵ Yet Sanivation’s business growth soon stalled when another potential client base—women, who have expressed interest in and the need for in-home toilets—were not using the service as they had anticipated. Sanivation discovered that men’s perceptions and control over household purchases were preventing more families from installing the latrines or continuing the service.

For example, a woman in Naivasha, Kenya, signed up for the service to make it easier to use the bathroom. The woman was healing from post-birth complications and had to take her infant and 1-year-old with her to the community pit latrines each time she needed to use the toilet. While her husband was working away from home for several weeks, she had an in-home latrine installed and began paying for Sanivation’s weekly service. But when her husband returned, he refused to have the toilet in the home, saying it was unsanitary. Sanivation removed the container, and the woman was devastated. “She came to us crying after her husband made the decision and neglected to consider her needs,” Sanivation staff said.

Sanivation is now creating a campaign to engage men and religious leaders to combat misperceptions about in-home toilet facilities and help expand women’s access to sanitation.⁵⁶

2. Facilities and Use

Gender dynamics and power relationships within the home can also have implications for who uses facilities and when. Especially after puberty, women may face restrictions on their activities and access to sanitation facilities because of social norms and taboos around menstruation and sexuality.^{57,58} The ways in which these restrictions manifest are contextual and differ based on geography, religious affiliation, and more.

Across varied contexts, menstruating women are limited in their mobility and engagement in activities within and outside the home. Lack of adequate access to sanitation facilities, clean water, disposal mechanisms, and products can mean women stay close to home or, alternately, are alienated from their homes during menstruation. In extreme cases, community norms dictate that women are not allowed to join daily activities such as prayer or household meal preparation and chores, and may be banned from entering certain rooms in their house. One example is the social tradition of *chhaupadi*, through which menstruating women are exiled from their homes and also face dietary, sanitary, social, and religious restrictions. These include where they can access water or bathe, which can perpetuate poor sanitation and hygiene, increase risks of sanitation-related illness, and impact school or work attendance.^{59,60} Similarly, the Gumuz people in Ethiopia send girls into isolation away from their family for a period of time when they begin menstruating. Other Ethiopian ethnic groups

send girls away from their families to live in groups. Even when girls are allowed to continue living with their family, they face restrictions on leaving their home, eating with their family, and more due to misperceptions about cleanliness.⁶¹

Newly married women in some cases need to negotiate time, place, and support for sanitation access and use. A study in India found that newly married women face restrictions on when they are allowed to defecate and who accompanies them.⁶² Additionally, there are expectations for how women must behave if and when they leave the house to engage in sanitation-related activities to protect the family reputation.⁶³

In general, social expectations about modesty mean that women should not be seen urinating, defecating, or washing. In multiple studies, women report walking long distances or waiting until dark to defecate or urinate in privacy.⁶⁴⁻⁶⁶ Women also report abstaining from eating or drinking, or they hold their urine at work, to avoid having to access latrines or open defecation sites during daylight and risk being seen or harassed by men.⁶⁷⁻⁶⁹ Women say they lack privacy when using a shared “pot” in informal settlements, which is compounded by lack of space, proximity to family members, and public latrines that are not safe to access at night.⁷⁰ Studies show that women experience humiliation, stress and fear of gender-based violence (GBV) when defecating outside and therefore seek in-home solutions for privacy. Women in Uganda and Kenya resort to defecating into plastic bags inside their homes to avoid defecating in public.^{71,72}

Case Study

Considering norms in product design and placement

In Rajasthan, India, the government launched a project to address women’s safety, privacy, and sanitation needs by building household latrines.⁷³

Women had been holding their urine during the day and then walking to the community latrines in the dark. Yet in the project’s initial implementation, women were not consulted about where to place the latrines, resulting in latrines that they couldn’t actually use. Most were placed in household courtyards—traditionally spaces reserved for men and guests, not women. Project leaders ultimately sought both women’s and men’s participation in site selection, and new latrines were placed in more private areas of the house where women could use them without others knowing when and how frequently they went. Despite this important insight, men in the community still did not advocate for or see the value in increasing women’s participation in sanitation planning activities in the community.⁷⁴



Swapnil Chaturvedi, president and chief executive of Samagra Waste Management, inspects a ‘nano-loo’ that his company has installed in a slum household in Pune, India. ©Bill & Melinda Gates Foundation/Paul O’Driscoll

When women access facilities outside the home, especially at night, they are at risk of violence and harassment. Around the world, women experience GBV both inside and outside their homes. The link between GBV and sanitation is evidenced by how frequently women's and girls' sanitation decisions and practices are determined by perceptions of safety and fear of GBV (Figure 2). Studies across diverse geographies document GBV occurring while women are urinating or defecating in the open, walking to public toilets, and using sanitation facilities.⁷⁵⁻⁸¹ Hulland et al. found that rape when accessing sanitation was a significant concern for a majority of women, and especially for adolescents, whose concerns were the most salient, frequent, and severe. Both men and women under-report their experiences of violence, making it challenging to uncover and assess accurate data. A few studies are, however, showing that young men and boys, like women, may also be at risk

of violence near public latrines and water points that are exposed and especially dangerous after dark.^{82,83} In a mapping exercise conducted as part of a study in Afghanistan, boys drew their surrounding environment and noted latrines and water points as among the most dangerous places in the community.⁸⁴⁻⁸⁶

The number and placement of toilets in public spaces, public institutions, and commercial buildings also noticeably influence men's and women's sanitation access and use. Urban areas commonly have a limited supply of public facilities for women. In Mumbai, India, for example, the municipal government provides 5,993 public toilets and 2,455 urinals for men but only 3,536 public toilets for women.⁸⁷ A study by RTI found that in Ahmedabad, public facilities for men outnumber those for women by nearly 42%.⁸⁸

Figure 2: Anecdotal story



© Getty images from Mathare

“Past eight, we can't go out to use the toilet. There is no lighting and the men drinking Chang'aa [local alcohol] on that side, get violent with us, even girls. We are forced to use a bucket...a bucket in one room in front of your children, fathers and brothers. Can you imagine? Sometimes we use the 'flying toilets' at night but your neighbors don't like this. Without any garbage collection, I wake up at dawn and sneak away to empty the bucket or dispose the bag. There is no dignity in our toilet situation.”
– Woman living in Mathare informal settlement, Kenya

Lack of separate facilities for boys and girls in schools is a significant barrier to use for girls, especially during menstruation. In 2012, 40% of all government schools in India lacked a functioning common toilet, and another 40% lacked a separate toilet for girls.⁸⁹ Several studies report that girls do not change menstrual pads in school.^{90,91} Girls may avoid using toilets for fear of leaving blood spots in the latrine, if there is not an adequate water supply for washing.⁹² In a study in Nepal, 41% of girls cited a lack of privacy for cleaning and washing as their primary reason for school absenteeism during menstruation, and 57% of girls in South Sudan report the lack of a private place to change as their primary reason for school absenteeism during menstruation.^{93,94} In India, girls who stopped going to school altogether say they would return if proper toilet facilities existed.⁹⁵

School overcrowding, lack of privacy, and poor facility maintenance can deter use by boys and girls. In schools based in urban settings, overcrowding and toilet maintenance are the most significant challenges for boys and girls. In rural-based schools, limited access to adequate infrastructure and water in schools is more critical.⁹⁶⁻⁹⁹ Program and product research has also found

that male guards or janitors can deter women from using public sanitation facilities.¹⁰⁰⁻¹⁰⁶

Women are unlikely to take on leadership and decision-making roles in participatory behavior change programs. There is little research specifically linking women's leadership to sanitation outcomes. However, there is evidence that inclusive and participatory approaches that engage all members of the community have been among the most successful approaches to eliminating open defecation and ensuring sustained behavior change. These efforts include women as beneficiaries, but less frequently include women as decision makers. Participatory approaches, such as community-led total sanitation (CLTS), must engage all members of the community to sustainably eradicate open defecation practices.^{107,108} Despite the importance of inclusivity in the participatory process, women's specific needs are rarely elevated.¹⁰⁹⁻¹¹³ This is in part because community-based sanitation programs have done little to bring women into decision-making roles in community-level committees—a core part of the CLTS process. CLTS programs also rarely engage men in dialog about gender and rarely attempt to shift gender roles and power dynamics between men and women at the household and community levels.¹¹⁴

3. Construction and Maintenance

Men take on household roles related to both building and financing sanitation facilities. Early evidence shows that men are more commonly responsible for toilet construction and financing.¹¹⁵⁻¹¹⁷ Latrines can be built into the marriage bargaining process. Women and their parents put pressure on men to build latrines to secure marriage proposals and show they can provide for their families.¹¹⁸

Women more commonly carry the bulk of the day-to-day burden associated with maintaining sanitation facilities. Women’s and girls’ disproportionate responsibility for water collection has been well researched,¹¹⁹ though fewer studies examine the additional burden of

sanitation.¹²⁰ Evidence from studies in South Asia and East Africa largely show that latrine cleaning is often a woman’s role.¹²¹⁻¹²⁶ Women may also have an increased burden because they lack adequate, safe ways to dispose of their menstrual products and instead throw them in the toilet, blocking the pipes.^{127,128} It is often women’s responsibility to manage menstrual waste, as men perceive women’s blood to be unclean.¹²⁹

It is critical for organizations and businesses working in sanitation to understand gender inequalities and address these differences in the user journey to ensure that women are meaningfully engaged across the sanitation sector. The next section covers the existing evidence on gender differences across the fecal sludge value chain, highlights gaps in data, and considers the impact of these differences on sanitation outcomes for all.

Sanitation | Waste Value Chain

There are significant data gaps in the field’s understanding of gender differences in participation and decision-making in the fecal sludge value chain (Figure 3, below). Women are disproportionately underrepresented in organizations across the sector, which influences product and service

design. Emerging evidence underscores the importance of actively engaging diverse perspectives and experiences to ensure products, services, and systems are designed to address users’ gender differences.

Figure 3: Fecal Sludge Value Chain



4. Containment, Emptying, Transport, Treatment, and Reuse/Disposal

Latrines and related products are designed with some consideration for differences in men and women's biological needs. However, designers pay limited attention to cultural and normative factors that influence men's and women's sanitation facility and product use.

Actors in the sector tend to focus on designing programs and products for defecation but largely fail to consider women's specific needs for privacy during post-defecation cleaning, urination, ritual bathing, dressing, and menstrual hygiene management.^{131,132} In a community in West Bengal, India, toilet designs did not consider women's need for privacy and corresponding preference for taller, brick-and-mortar toilet cabins. As a result, household latrines without walls and roofs did not provide adequate privacy, were rarely used by women, and perpetuated open defecation practices among women.¹³³

“Sanitation programs, as with many other development programs, have been built around assumptions on some sort of ‘gender-neutral’ person who does not exist in reality. Men's interests, needs, and priorities in relation to sanitation may well be as neglected as women's.”¹³⁰

Case Study

Women-led efforts deliver inclusive program design

In the slums of Mumbai and Pune, India, a women's network sought input from other women to improve government community toilets. At some public toilets, women's and men's stalls faced each other, while other toilets had entrances facing the street. In both cases, women were uneasy with the layout and reported cases of harassment when they used the toilets.

Members of Mahila Milan, a decentralized network of poor women who manage credit and savings activities within their communities and provide loans to other women, consulted other women from local self-help groups about how to improve the facilities. Using the feedback it received, the network—run jointly by a local NGO and the National Federation of Slum Dwellers—worked with the municipal government of Mumbai to construct separate men's and women's entrances and align stalls back to back to minimize men's and women's interactions. It also improved the toilets' design by adding stall doors that swing both ways, making it easier for maintenance workers to keep the facilities clean.^{134,135}



A run-down municipal toilet in a slum in the Vashi Naka locality of Mumbai, India. ©Bill & Melinda Gates Foundation/Prashant Panjari

Failure to consider gender differences in product and service design can add to women's workloads and affect their education and income. Poor sanitation directly correlates with women's time lost addressing health concerns (contacting pathogens and becoming sick or seeking healthcare), cleaning water (collecting clean water or boiling dirty water), and accessing the toilet (finding a suitable place to defecate, either in the open or at public facilities), which takes away from time they can spend going to school or work. For example,

the flush latrine in India requires more water than ecological sanitation, and women and girls must typically collect and carry the water.^{136,137} Women may also need to collect fecal sludge, dispose of “night soil,” teach children about sanitation, toilet train children, and dispose of diapers and children's feces.^{138,139} All of these duties contribute to women's time poverty.¹⁴⁰ Improvements in sanitation can relieve the issue but do not address the underlying cause.¹⁴¹



A grandmother on her way to collect water for the second time today from a tap in the water main in the mountains north of Durban, South Africa. ©Bill & Melinda Gates Foundation/Joan Sullivan

Case Study

Technology design does not consider women's needs

Aqua Privy, an organization in South Africa, created a new sanitation technology that requires little water and reduces odor, yet using the toilet soon became a degrading experience for women.

The toilet required users to pour water into the bowl after use and empty the sludge periodically. Women felt humiliated when they had to fetch water publicly for their toilet. The toilets were also too small for pregnant women to use comfortably. They also did not allow for the disposal of sanitary pads, and women seen emptying the toilet bowl were considered unmarriageable by senior members of the community.

A review of the project found that the local civic organizations involved in the design were all headed by men, and women did not participate in the design or delivery of the system.^{142,143}

Solutions that do not consider gender differences can be costlier for women. Experts argue that pay-per-use latrines may be inequitable for women because they have to use facilities more frequently than men for their own and their children's needs. Men, on the other hand, typically use these facilities only for defecation and therefore need to use them less frequently.¹⁴⁴⁻¹⁴⁷ In Kampala's slums, pay-per-use facilities cost an estimated US 12 cents to 20 cents per use.¹⁴⁸ This creates a barrier for women, especially those who have no income or earn considerably less than men and/or who have limited control over household financial resources.¹⁴⁹

"It goes against the laws of non-discrimination if all public toilets are pay for use. If you have pay-per-use, men will go once for defecation and use the street for the 'short call.' Women have to use the latrine four to five times per day." – Isha Ray, University of California, Berkeley¹⁵⁰

Current system-level efforts, particularly incinerator technology, to address the disposal of menstrual waste do not adequately consider the user and may have a

negative impact on both the user and the environment.

The Government of India encourages incinerators as a solution to dispose of menstrual waste, particularly in schools. NGO and school staff highlight that often girls themselves have to handle the incinerator, which exposes them to health hazards. There are instances of incinerators not reaching 900 degrees and thus not processing menstrual waste properly. It is also common for incinerators to be too large, which is problematic because it is not efficient to burn the pads until the incinerator is full.¹⁵¹ The longitudinal effects of using incinerators on the environment and human beings are not yet studied.¹⁵²⁻¹⁵⁴

Existing solid waste management systems have not been configured to collect and process menstrual waste, causing significant blockage problems when used products are disposed of in these facilities.¹⁵⁵

Mavoko Water and Sewerage Company, a utility in Kenya, reports that menstrual pads alone constitute about 40% of the material hauled from blocked sewers. Because the frequency of blockages exceeds the company's ability to respond immediately, blockages are often not resolved until the day after they are reported, leading to sewage

backflows into homes, which are a serious health hazard.¹⁵⁶ It is difficult and expensive to properly process fecal sludge that contains non-biodegradable sanitary pads, so this waste often remains in the sludge, creating problems when it is reused in agriculture applications.

Sanitation enterprises are beginning to consider ways to incorporate women’s voices and preferences into the process of designing sanitation facilities and solutions.

A review of interventions indicates that participation of

women contributes to more user-friendly designs and improved sanitation outcomes. Utthan, an organization in India that seeks to improve water and sanitation services through capacity-building and community mobilization, co-developed a process with the community that required half of the water committee members to be women. As a result, sanitation water posts were placed in locations that women prefer, providing improved convenience and safety for all community members.¹⁵⁷

Case Study

Donor investment in technologies and user research

Transformative technology is one of the five areas of focus in the Bill & Melinda Gates Foundation’s WSH program strategy. The foundation funds research to develop innovative toilets that do not require a sewer, water connection, or electricity.¹⁵⁸ One example is the Nano Membrane Toilet (NMT), also called the Clean Toilet, which is an off-grid solution designed to be convenient, modern, hygienic, user friendly, and affordable for households.

During preliminary human research and user testing to develop the product, researchers found that the toilet did not accommodate women’s physical and cultural preferences. For example, women consistently stopped using their in-home toilet during menstruation. In the redesign process, engineers considered safety (by including locks), toilet placement, toilet appearance, and other design changes in an effort to increase use of the product overall, especially among female users.¹⁵⁹

User testing also identified interesting barriers to men’s use of the toilets. For instance, households invested in toilets for use by women, children, the elderly, and the disabled, but young men were expected to use public toilets or defecate openly, which poses a health hazard for the whole community.

While the program team was not initially considering differences between men and women, barriers to growth and product uptake ultimately elevated the importance of gender. The program strategy team at the foundation hopes to transfer these learnings to other grantees within the Transforming Technologies portfolio to enhance their awareness of gender-based barriers for use in future toilet designs.¹⁶⁰

Men hold the majority of professional positions across sanitation enterprises.

A study of water and sanitation businesses in Indonesia, Vietnam, and Timor-Leste shows that they are predominantly run by men. Recent studies show an increasing number of women operating in the sector, particularly as societies begin to accept less traditional roles for women and men.¹⁶¹ A study in Addis Ababa, Ethiopia, found that the majority of micro-enterprise cooperative workers—comprised of community based organizations (CBO) members—are women.¹⁶² Yet, in the 2011 Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS), half of the countries surveyed reported that women comprise less than 10% of total professional water and sanitation staff.¹⁶³



III. GENDER AND ITS ROLE IN SANITATION POLICY

In recent years, national governments have been pushing boundaries and adopting gender-sensitive policies aimed at improving sanitation outcomes for women and girls. India and Uganda, for example, have enacted gender policies and designed national menstrual hygiene management (MHM) guidelines. These have helped to elevate the importance of gender differences in sanitation, education, and sexual and reproductive rights in policy discussions. Implementation of the policies at the state and local levels, however, has been slow. Additionally, women are still underrepresented in leadership roles and lack adequate decision-making power even when placed in roles of authority. Structures are needed to ensure national policies trickle down to the state and local levels so that gender-sensitive approaches have impact. SDG 6—which aims to ensure access to water and sanitation for all—emphasizes reaching women and girls and could motivate greater inclusion of gender considerations in sanitation policymaking and implementation.

National policies focused on gender and/or women’s empowerment, while not always inclusive of sanitation, could help bring greater awareness to the influence of gender across individuals’ daily lives. In 2016, India drafted a national policy for women to create a vision for empowering women across the country. The policy references the need to engage women’s groups in the operation and maintenance of toilets in rural areas; educate women and girls on the dangers of unhygienic practices; and find opportunities to mitigate women’s water burden.¹⁶⁴ Uganda’s National Gender Policy encouraged the water and sanitation sector to develop its first water gender strategy in 2003, which was updated in 2009. The water gender strategy is aimed at empowering women, men, and vulnerable groups and reducing poverty by ensuring equitable access to and control of water and sanitation resources.¹⁶⁵

While many national sanitation policies have traditionally failed to consider the specific needs of women,^{166,167} countries are increasingly adopting MHM guidelines to improve conditions for women and girls in urban and rural settings. India, Kenya, Ethiopia, and

Uganda are examples of countries that have invested in a collaborative process to develop national guidelines that standardize and create a baseline vision for improved MHM practices.¹⁶⁸ National guidelines set a vision for coordinated, multi-sector action on MHM, including health, education, and water and sanitation. MHM is also often embedded in other policy frameworks, including water and sanitation, health, and education.¹⁶⁹

National governments are directly addressing discriminatory behavior associated with sanitation and gender inequality. In Nepal, the practice of chhaupadi requires women and girls to stay in a special hut outside the home during menstruation. Women and girls are exposed to cold weather and are at greater risk of violence. There have also been reports that many women who have recently given birth die in the hut due to ruptured uterus and/or infections relating to a retained placenta. The Supreme Court of Nepal banned this practice in 2005, and in 2010 the National Plan of Action against Gender-Based Violence in Nepal formally declared chhaupadi a form of violence against women. The government also partners with the UN Trust Fund to run an awareness and behavior change campaign that works with peer educators and local community members to build understanding of the dangers of this practice in an effort to further curb the practice.¹⁷⁰ In August 2017, the parliament of Nepal unanimously passed a law criminalizing chhaupadi.

Training efforts on the role of gender in sanitation that target government staff and policymakers are becoming more prevalent. In Senegal, the Water Supply & Sanitation Collaborative Council (WSSCC) and the UN Women Joint Programme on Gender, Hygiene and Sanitation provided train-the-trainer sessions on MHM. The Senegalese Ministry of Water and Sanitation contributed 25% of the budget for the sessions and paid for eight ministry staff members to participate. As a result, these participants recommended building toilets in schools and considering MHM needs in the design of public spaces, such as creating separate toilets for boys and girls and including a space for drying sanitary materials.¹⁷¹

Despite these advancements, many sanitation policies have yet to integrate a gender lens and do not intentionally consider gender differences in the design of public sanitation systems and solutions. India's National Urban Sanitation Policy (2008) aimed to create universal sanitation through behavioral change programs and city-integrated sanitary installations. However, the policy did not provide ways to address the lack of basic safety for women users, collect sex-disaggregated data, or require women's input and engagement in facility design and placement, limiting the effectiveness of the policy.¹⁷² Uganda's Poverty Eradication and Action Plan focuses sanitation efforts on the household as a whole—instead of men and women within the household—while using government and other stakeholders as facilitators. Practitioners suggested that the policy may actually reinforce traditional gender roles for women, such as cleaning, collecting water, and washing, and may increase women's workloads, but further research is needed to confirm this.¹⁷³

Women's voices are underrepresented in sanitation-related policymaking and governance.¹⁷⁴ Quotas in local sanitation governing committees have helped to increase women's participation. A large body of research suggests that women in decision-making roles are more likely to enact policies that reflect women's preferences. Yet women's participation doesn't always translate to increased decision-making power, notably when they feel a pressure to "vote along lines of existing social norms"¹⁷⁵, which may result in tokenism rather than voice in decision making. Efforts to improve women's participation in governing bodies and committees are promising, and more research is needed to further understand the link between women's participation and improved sanitation outcomes for the community.¹⁷⁶⁻¹⁷⁸

To achieve successful outcomes, states and local governing bodies must secure budget for implementation and tailor programming to meet specific community needs.¹⁷⁹ The 2011 GLAAS report shows that national governments spent about 2% of their WASH budgets on hygiene, which did not include MHM.¹⁸⁰ MHM guidelines have been helpful in establishing direction and focus for districts and states, but limited or nonexistent budgets tend to undermine implementation.

Discriminatory regulations and policies outside the sanitation sector also impact sanitation access for women. In many contexts, women do not have the right to inherit, own, and control land and property, either by statutory or customary law. This influences women's ability to control decisions related to the construction of sanitation facilities within the home. Water and sanitation utility companies may require proof of land ownership

in the form of a title deed in the name of the head of household before connecting a household to water and sanitation services.^{181,182} Additionally, research indicates that households are less willing to invest in private sanitation facilities if they do not own their land because of the cost of these facilities.¹⁸³

SDG 6, which ensures access to water and sanitation for all, has created momentum across governments, donors, and corporations to invest in innovative and inclusive solutions for those most in need. There is greater recognition that better data, including sex-disaggregated data, can help to inform approaches that accommodate the diverse needs of women, children, the disabled, the elderly, and more. However, the supporting indicators in Goal 6 do not, in and of themselves, encourage use of sex-disaggregated data and tracking of gender differences. For example, Goal 6.2—"By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations"—suggests that the following indicators be used to track progress: (1) proportion of the population using safely managed sanitation services, including a hand-washing facility with soap and water; and (2) proportion of the population using safely managed drinking water services. Neither of these indicators specifically calls for tracking gender differences in access and use of sanitation and hygiene services. Additionally, Goal 6.b.1—"proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management"—does not explicitly make note of women's participation within these local decision-making bodies. Leveraging indicators from SDG 5, "Achieve gender equality and empower all women and girls," can help guide sanitation sector actors on investments and priorities when integrating gender into their work.

Understanding gender differences in user preference, decisions, influence, roles, and responsibility along the value chain is critical to ensuring access to safe and hygienic sanitation for all. In order to identify and design for these gender differences, the sanitation sector—including NGOs, donors, governments, and private-sector actors—needs to be more intentional about bringing a gender lens to the work. The section below explores examples of actors in the sanitation sector that are taking these steps.

IV. EMERGING APPROACHES TO GENDER INTEGRATION IN DEVELOPMENT

There is no single leading example of what it means to take a comprehensive approach to gender integration across sanitation programming and policy in the development sector. However, donors, policymakers, and practitioners are taking important steps toward understanding the role of gender in their work, allowing them to support better design and implementation of sanitation programming.

This section highlights examples of gender integration activities that can provoke ideas and highlight practical ways sanitation actors are already using a gender lens to implement solutions that are more responsive to a wider range of needs. The examples and suggestions listed below are illustrative—they serve to generate conversations and initial ideas for the development field to build on and, ultimately, integrate into sanitation efforts within existing organizational structures, policies, and practices.

Development organizations increasingly bringing a gender lens to their work in sanitation include the following:

- **The Swedish International Development Cooperation Agency (SIDA)** has implemented a top-down mandate that clarifies and improves standards and consistency for gender integration across all investments, including WASH and sanitation. SIDA's Gender Tool Box¹⁸⁴ provides practical guidance on how to conduct gender analyses and analyze differences among men, women, boys, and girls in terms of their relative distribution of resources, opportunities, constraints, and power in a given context. The Tool Box also includes checklists for staff that highlight what to include in a gender analysis. SIDA has mandated gender mainstreaming in all its programs and has identified three entry points to address gender within WASH programs: policy, operations, and monitoring and evaluation (M&E).
- **World Bank** has prioritized a focus on gender in its sanitation work by creating toolkits, frameworks, and case studies to guide practitioners seeking to take a more integrated approach to addressing gender differences in sanitation programming. The World Bank created a toolkit on gender in water and sanitation, provided guidance on mainstreaming gender in water and sanitation, and has sector-specific case studies and project documents that detail effective approaches for integrating a gender lens.¹⁸⁵
- **The Bill & Melinda Gates Foundation** has a Gender Equality team that supports program strategy teams, including the WSH team, by providing technical assistance and training to program officers in integrating a gender lens in their investments. Among other current investments, the WSH team is building the evidence base by supporting Population Council to conduct a randomized controlled trial on ZanaAfrica's MHM program that aims to improve outcomes for girls through pad distribution and comic book educational programming.
- **WaterAid** integrates gender analyses into program design across many of its CLTS programs. WaterAid consults women across all its sanitation programming to understand their preferences related to sanitation design, privacy, safety, and distance; involves women as health promoters; and/or includes women as members of water committees. In its policy and advocacy work, WaterAid brings women's perspectives on sanitation preferences in front of policymakers. Most recently, the WaterAid team developed its document "Steps to Inclusive Water, Sanitation, and Hygiene" that guides facilitators to consider the diverse needs of community members, including women and vulnerable populations.
- **Plan International** has developed a Gender and WASH Monitoring Tool.¹⁸⁶ The tool explores gender relations between men and women and generates data on indicators such as levels of shared WASH workload, WASH decisions in the household, and leadership of women in the community around WASH. It also suggests step-by-step participatory activities and training for staff to help conduct such analyses.¹⁸⁷
- **UN Women**, in alignment with SDG 6, supports national governments to craft policies and programs to better respond to women's WASH needs. Impact assessments of these efforts are ongoing.¹⁸⁸
- Organizations like **WSSCC** are aiming to build the evidence base and leverage research and training to influence policy.¹⁸⁹



Gihembe Refugee Camp in Gicumbi District, Rwanda is a haven for refugees from the Democratic Republic of Congo. ©Bill & Melinda Gates Foundation/Jake Lyell

Spotlight

Sanitation actors take a gender lens in humanitarian responses

Evidence from a gap analysis survey in six countries shows that sanitation facilities in refugee camps, when available, frequently fail to take into consideration the specific safety and privacy needs of women and girls.¹⁹⁰ Sanitation facilities are typically not separated by gender and are installed far from living spaces, often in isolated and unguarded locations.¹⁹¹ This poses a challenge for women and girls, people with disabilities, children, and the elderly,^{192,193} and elevates the risk of sexual violence.^{194,195}

To respond to situations like these, several guiding documents have been developed for humanitarian practitioners over the last decade to address the sanitation and hygiene needs of displaced populations, particularly women and girls, during humanitarian crises. *The Sphere Handbook: Humanitarian Charter Minimum Standards for Humanitarian Response*¹⁹⁶ (2011) comprises specific standards for MHM in emergencies, such as the provision of sanitary materials, washing basins, and underwear as well as the participation of women in designing water and sanitation interventions. While emergency response guidelines have increasingly taken gender-related issues such as MHM into consideration, the extent to which they are implemented requires further research. Sommer points out that these documents are not used by all humanitarian responders and some may not be comprehensive enough to fully meet the needs of women and girls.¹⁹⁷

NGOs working in the field of emergency response do regularly distribute personal dignity and hygiene kits with sanitary products to women in refugee camps. However, these kits are sometimes distributed only once throughout the emergency response period,¹⁹⁸ are incomplete (e.g., the kits may include pads but not the underwear required for their use), or do not consider the cultural and age-appropriate preferences of diverse populations in camps.^{199,200} In terms of infrastructure, often there are no private facilities available for washing and drying reusable sanitary cloths^{201,202} nor systems for safely disposing of menstrual waste.²⁰³ The breakdown of social systems and structures noted above also means that in emergency situations, adolescent girls may be separated from grandmothers, mothers, sisters, and/or friends who would otherwise provide information and advice on menstruation and puberty.²⁰⁴

Emerging practices in gender integration

Though gaps remain, sanitation actors are progressing in their approach to gender integration by investing in research, providing staff training, conducting gender analyses, and more. Below is a summary of emerging practices identified through this evidence review that can serve as a reference point for actors interested in exploring practical ways of integrating a gender lens into their work. This list, while not exhaustive, captures an initial set of practices identified in the evidence review to help actors continue to share ideas for how to improve their work in this space.

- **Portfolio assessment and categorization:**

Organizations can conduct a thorough review of their current investments, programs, or policies and categorize each based on level of gender integration in the design, implementation, and measurement of the work.

- **Context-specific gender analyses:** Conducting a systematic examination of gender differences leads to the identification of gender-based barriers to sanitation for women and men, and for girls and boys. Both quantitative and qualitative research can provide insights into gender inequality in access to and use of sanitation facilities and services, control over resources, power dynamics in the household and community, agency, and mobility. Including diverse voices across gender, age, location, ethnic group, economic class, and education level in such analyses will lead to better gender integration in project design, implementation, and monitoring.

- **Program development, design, and measurement:**

Once sanitation actors identify gender-based barriers to sanitation, they can craft programs that target these barriers to improve sanitation outcomes.

Interventions to foster women's empowerment or address deeply rooted gender inequalities may also be required. Addressing gender differences may not require a separate program or investment but can be done by updating program design. It is also critical for programs to build M&E frameworks that include sex-disaggregated data, measures of women's and girls' empowerment, and gender-sensitive indicators that measure different people's roles, responsibilities, and access to and agency over resources.

- **Engagement and partnership:** Working in partnership is fundamental in order to review the results of gender analyses and discuss ways to improve approaches to integrating a gender lens across the program, policy effort, and/or product design process. Donors, for

example, can identify new opportunities to support existing grantees, which could include providing guidance on practical tools, review of an approach to gender analyses, additional funding to cover costs of additional research, support for the development of a more robust M&E framework, and/or requirements for measurement of specific outcomes. Likewise, implementers can engage donors in site visits, share data to build awareness and understanding of the importance of gender, and consider a gender lens when designing and implementing sanitation programming and policy.

- **Knowledge sharing:** Diverse actors can learn from each other's work by sharing and building capacity across donors, policymakers, private-sector actors, and nonprofit implementers; by sharing lessons publicly to build the broader knowledge base and create awareness about the importance of integrating a gender lens across the sanitation value chain; and by convening these groups to share best practices, discuss opportunities to overcome barriers, and share programming challenges to avoid future mistakes and unintended consequences.
- **Program and leadership training:** Staff at all levels can benefit from training opportunities that include an introduction to gender, gender inequalities, and potential implications for health and other development outcomes. Such trainings can build shared understanding of empowerment and other related concepts—such as agency, control, and mobility—and the relevance of these concepts when designing programming and addressing barriers to sanitation access in the home or community. Case studies play an important role in supporting staff to think through gender differences and the potential impact of these differences on sanitation access.
- **Closing research gaps:** Conducting evidence reviews to uncover research gaps and share gaps with the field can build momentum among other funders and research institutions. Research is needed to fill specific evidence gaps and inform the field to strengthen investments in gender and sanitation. Evaluation research is needed alongside programming to understand the effectiveness of intentional gender programming on sanitation outcomes for all.

Donors, policymakers, and implementing organizations are all using these emerging practices, and there is opportunity to continue building on existing practices within organizations to take a more intentional approach to gender in sanitation.

V. CONCLUSION

Gender matters in sanitation. Gender inequalities pose significant barriers to achieving sanitation outcomes for all, especially women and girls. To improve sanitation outcomes, we need further investment in understanding gender differences and filling gaps in evidence across the user journey and value chain. There is convincing evidence of gender differences in user preferences, access, and usage behaviors but little evidence on the influence of gender differences and women's engagement in the sanitation sector. This makes it challenging to gauge the causal links between considerations of gender differences and improvements in sanitation outcomes for all. Further research exploring these links will help to guide future program and policy design.

These five learnings are crucial to advancing the research:

- 1. Research informing program, product, and policy design needs to be more inclusive. A critical starting point is ensuring that the voices of women and men of all ages are included at each stage of development.** A human-centered design approach can help to identify contextual constraints and barriers that effectively inform design. An initial gender analysis can help researchers and designers be more informed in asking diverse questions that will identify gender inequalities, norms, or differences in preferences and use that may not be obvious but may have a direct effect on outcomes.
- 2. Understanding downstream dynamics and the user journey is important for all actors in the sanitation sector, not just those that seek to influence behavior change or create relevant community-level policies.** Engineers and designers need to assess contextual factors and power dynamics because they affect product use. Issues of gender differences in sanitation are related to broader trends and gender inequalities. For example, women's underrepresentation in sanitation enterprises, especially in leadership roles, may be reflective of norms and expectations about women's roles and the appropriateness of their engagement in the sector. Failure to include women's input and leadership in policy, programming, and product design deprives the sector of women's perspectives and may be contributing to worse outcomes for all.
- 3. It is critical to engage men in identifying gender differences and removing barriers for women to achieve sustained outcomes and access to sanitation for all.** Gender dynamics are relational and stem from differences in the relative power between men and women. Programs and policies need to consider how to build community-level understanding of gender differences and pursue behavior change for both men and women to ensure women feel supported and safe accessing facilities within their communities. This can also serve to redistribute roles and responsibilities across men and women to make them more equitable. Men can be important advocates for women and gender equality.
- 4. Individual advocates within organizations that value and promote the importance of gender in sanitation can build momentum among leaders and across teams.** However, organizations must systemize and institutionalize processes for bringing a gender lens to sanitation programming, policy, and investments. Otherwise, personnel changes can derail progress. Collaboration and sharing across sectors will also help sanitation actors make progress and implement known best practices for overcoming inequalities, empowering women, and improving outcomes for all.
- 5. Access to sex-disaggregated data and investment in qualitative and quantitative research at each stage of the value chain are critical to identify important gender differences and build an accurate understanding of their influence on sanitation outcomes for all.** Starting with a neutral approach and avoiding assumptions about where and how gender plays a role in sanitation will be important to the success of future efforts.

While significant literature gaps exist, evidence clearly indicates that a failure to consider the influence of gender differences across the sanitation sector can limit, if not stymie, progress toward achieving universal sanitation access. Now is the time for the sanitation sector to lead in addressing gender inequalities and show other sectors the importance of using this lens to improve outcomes for all.

End notes

- Note: Definitions taken from the Bill & Melinda Gates Foundation's Gender Lexicon, which is informed by a variety of sources including the African Union, the European Institute for Gender Equality, and UN Women. The definition of sanitation references CDC, <https://www.cdc.gov/healthywater/global/sanitation/index.html>; WHO, <http://www.who.int/topics/hygiene/en/>; and WaterAid Sanitation Framework, www.wateraid.org/publications.
- Yaser Ali Badran et al., "Impact of Genital Hygiene and Sexual Activity on Urinary Tract Infection During Pregnancy," *Urology Annals* 7, no. 4 (2015), doi:10.4103/0974-7796.157971.
- Colin Sumpter and Belen Torondel, "A Systematic Review of the Health and Social Effects of Menstrual Hygiene Management," *PLoS ONE* 8, no. 4 (2013), doi:10.1371/journal.pone.0062004.
- Padma Das et al., "Menstrual Hygiene Practices, WASH Access and the Risk of Urogenital Infection in Women from Odisha, India," *PLOS ONE* 10, no. 6 (2015), doi:10.1371/journal.pone.0130777.
- UNICEF and WHO, "Diarrhoea: Why Children Are Still Dying and What Can Be Done," 2009.
- Maggie A. Montgomery and Menachem Elimelech, "Water And Sanitation in Developing Countries: Including Health in the Equation," *Environmental Science & Technology* 41, no. 1 (2007), doi:10.1021/es072435t.
- June J. Cheng et al., "An Ecological Quantification of the Relationships between Water, Sanitation and Infant, Child, and Maternal Mortality," *Environmental Health* 11, no. 1 (2012), doi:10.1186/1476-069x-11-4.
- Krushna Chandra Sahoo et al., "Sanitation-Related Psychosocial Stress: A Grounded Theory of Women Across the Life-Course in Odisha, India," *Social Science & Medicine* 139 (2015), doi.org/10.1016/j.socscimed.2015.06.031.
- Kristyna R. S. Hullah et al., "Sanitation, Stress, and Life Stage: A Systematic Data Collection Study among Women in Odisha, India," *PLOS ONE* 10, no. 11 (2015), doi:10.1371/journal.pone.0141883.
- Keren Massey, "Insecurity and Shame Exploration of the Impact of the Lack of Sanitation on Women in the Slums of Kampala," Issue brief, SHARE (2011).
- Bethany Caruso, interview with FSG, October 5, 2016.
- Sahoo et al., "Sanitation-Related Psychosocial Stress"
- Julie Hennegan and Paul Montgomery, "Do Menstrual Hygiene Management Interventions Improve Education and Psychosocial Outcomes for Women and Girls in Low and Middle Income Countries? A Systematic Review," *PLOS ONE* 11, no. 2 (2016), doi:10.1371/journal.pone.0146985.
- Hullah et al., "Sanitation, Stress, and Life Stage"
- UNICEF, *Equity of Access to WASH in Schools: A Comparative Study of Policy and Service Delivery in Kyrgyzstan, Malawi, the Philippines, Timor-Leste, Uganda and Uzbekistan*, 2011.
- Murat Sahin et al., *Raising Even More Clean Hands: Advancing Health, Learning and Equity through WASH in School*, New York: United Nations Children's Fund, 2012.
- Bethany A. Caruso et al., "Assessing the Impact of a School-based Latrine Cleaning and Handwashing Program on Pupil Absence in Nyanza Province, Kenya: A Cluster-Tandomized Trial," *Tropical Medicine & International Health* 19, no. 10 (2014), doi:10.1111/tmi.12360.
- Shannon A. McMahon et al., "'The Girl with Her Period Is the One to Hang Her Head' Reflections on Menstrual Management among Schoolgirls in Rural Kenya," *BMC International Health and Human Rights* 11, no. 1 (2011), doi:10.1186/1472-698x-11-7.
- Colin Sumpter and Belen Torondel, "A Systematic Review of the Health and Social Effects of Menstrual Hygiene Management," *PLoS ONE* 8, no. 4 (2013), doi:10.1371/journal.pone.0062004.
- Montgomery, "Do Menstrual Hygiene Management Interventions Improve Education"
- Kathleen O'Reilly, "From Toilet Insecurity to Toilet Security: Creating Safe Sanitation for Women and Girls," *WIREs Water* 3, no. 1 (2016), doi:10.1002/wat2.1122.
- Elizabeth Anne Tilley, Sabin Bieri and Petra Kohler, "Sanitation in Developing Countries: A Review through a Gender Lens," *Journal of Water, Sanitation and Hygiene for Development* 3, no. 3 (2013), doi:10.2166/washdev.2013.090.
- Sarah Jewitt and Harriet Ryley, "It's a Girl Thing: Menstruation, School Attendance, Spatial Mobility and Wider Gender Inequalities in Kenya," *Geoforum* 56 (2014), doi:10.1016/j.geoforum.2014.07.006.
- Jewitt, "It's a Girl Thing"
- Selamawit Tamiru et al., *Girls in Control: Compiled Findings from Studies on Menstrual Hygiene Management of Schoolgirls*, SNV, 2015.
- Marni Sommer et al., "WASH in Schools Empowers Girls' Education: Proceedings of the Menstrual Hygiene Management in Schools Virtual Conference 2012," New York: United Nations Children's Fund and Columbia University, 2013, http://www.snv.org/public/cms/sites/default/files/explore/download/snv_girls_in_control_baseline_report.pdf
- Sommer et al., "WASH in Schools Empowers Girls' Education"
- Montgomery, "Do Menstrual Hygiene Management Interventions Improve Education"
- Shannon A. McMahon et al., "'The Girl with Her Period Is the One to Hang Her Head' Reflections on Menstrual Management among Schoolgirls in Rural Kenya," *BMC International Health and Human Rights* 11, no. 1 (2011), doi:10.1186/1472-698x-11-7.
- Bethany A. Caruso et al., "Assessing the Impact of a School-based Latrine Cleaning and Handwashing Program on Pupil Absence in Nyanza Province, Kenya: A Cluster-randomized Trial," *Tropical Medicine & International Health* 19, no. 10 (2014), doi:10.1111/tmi.12360.
- Vipul Upadhyay, John Mathai, and Peter W. Reed, "Primary School Children: Access to Toilets," *Acta Paediatrica*, 97, no. 11 (2008), doi: 10.1111/j.1651-2227.2008.00969.x.
- Lillian Mwanri, Anthony Worsley, and Joseph Masika, "School and Anaemia Prevention: Current Reality and Opportunities—A Tanzanian Case Study," *Health Promotion International* 16, no. 4 (2001), doi-org.offcampus.lib.washington.edu/10.1093/heapro/16.4.321.
- Note: Women globally spend approximately twice as much time on unpaid work as men. This includes labor done for no pay, such as household chores and caring for children and the elderly.
- Di Kilsby, "Now We Feel Like Respected Adults: Positive Change in Gender Roles and Relations in A Timor-Leste WASH Program," *ACFID Research in Development Series*, no. 6 (2012).

-
35. Cheryl Doss, "Intrahousehold Bargaining and Resource Allocation in Developing Countries," *Policy Research Working Paper*, no. WPS 6337, Washington, DC: World Bank, January 2013.
 36. Esther Richards et al., "Going beyond the Surface: Gendered Intra-Household Bargaining as a Social Determinant of Child Health and Nutrition in Low and Middle Income Countries," *Social Science & Medicine* 95 (2013), doi:10.1016/j.socscimed.2012.06.015.
 37. Esther Duflo, "Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa," *World Bank Economic Review* 17, no. 1 (2003).
 38. Robert Dreibelbis, interview with FSG.
 39. Sahoo et al., "Sanitation-Related Psychosocial Stress"
 40. Jason Corburn and Irene Karanja, "Informal Settlements and a Relational View of Health in Nairobi, Kenya: Sanitation, Gender and Dignity," *Health Promotion International* 31, no. 2 (2016), doi:10.1093/heapro/dau100.
 41. Hullah et al., "Sanitation, Stress, and Life Stage"
 42. Kathleen O'Reilly, "'They Are Not of This House': The Gendered Costs of Drinking Water's Commodification," *Economic & Political Weekly* 46, No. 18 (2011).
 43. Tilley, "Sanitation in Developing Countries"
 44. Kathleen O'Reilly, "Combining Sanitation and Women's Participation in Water Supply: An Example from Rajasthan," *Development in Practice* 20, no. 1 (2010), doi:10.1080/09614520903436976.
 45. Doss, "Intrahousehold Bargaining and Resource Allocation in Developing Countries"
 46. Richards et al., "Going beyond the Surface"
 47. Duflo, "Grandmothers and Granddaughters"
 48. O'Reilly, "Combining Sanitation and Women's Participation in Water Supply"
 49. Yaniv Stopnitzky, "The Bargaining Power of Missing Women: Evidence from a Sanitation Campaign in India," *Munich Personal RePEc Archive*, no. 37841 (2012).
 50. Isha Ray, interview with FSG, October 5, 2016.
 51. Andrew Foote (CEO and Co-Founder, Sanivation), interview with FSG, May 2, 2017.; Emily Woods (CTO and Co-Founder), interview with FSG, April 14, 2017.
 52. 52 Hoang Van Minh et al., "Assessing Willingness to Pay for Improved Sanitation in Rural Vietnam," *Environmental Health and Preventive Medicine*, no. 4 (November 10, 2012), doi:10.1007/s12199-012-0317-3.
 53. ICRW and Acumen, "Women and Social Enterprises: How Gender Integration Can Boost Entrepreneurial Solutions to Poverty," 2015.
 54. ICRW and Acumen, "Women and Social Enterprises"
 55. Elise Guinee Cooper (Design, Sanivation), interview with FSG, May 9, 2017.
 56. Elise Guinee Cooper (Design, Sanivation), interview with FSG, May 9, 2017; Emily Woods, CFO, Sanivation, Interview with FSG, May 2, 2017; Jane Mugo, Sanivation Sales Team Lead, Interview with FSG, May 9,
 57. Sahoo et al., "Sanitation-Related Psychosocial Stress"
 58. Karanja, "Informal Settlements and a Relational View of Health in Nairobi, Kenya"
 59. Chhabi Ranabhat et al., "Chhaupadi Culture and Reproductive Health of Women in Nepal," *Asia-Pacific Journal of Public Health* 27, No. 7 (2015), doi: 10.1177/1010539515602743.
 60. United Nations Resident and Humanitarian Coordinator's Office, "Chhaupadi in the Far-West," *Field Bulletin*, no. 1 (April 2011).
 61. 61 Marilyn Ngales, "Sanitation Provision in Ethiopia's Regional Schools — Girls' and Women's Experiences," *Waterlines* 25, no. 3 (January 01, 2007), doi:10.3362/0262-8104.2007.004.
 62. 62 Krushna Chandra Sahoo et al., "Sanitation-related psychosocial stress: A grounded theory of women across the life-course in Odisha, India," *Social Science & Medicine* 139 (2015), 80-89.
 63. Robert Dreibelbis, interview with FSG, October 6, 2016
 64. Hullah et al., "Sanitation, Stress, and Life Stage"
 65. Sahoo et al., "Sanitation-Related Psychosocial Stress"
 66. Meera Bapat and Indu Agarwal, "Our Needs, Our Priorities; Women and Men from the Slums in Mumbai and Pune Talk about Their Needs for Water and Sanitation," *Environment and Urbanization* 15, no. 2 (2003), doi:10.1177/095624780301500221.
 67. Sahoo et al., "Sanitation-Related Psychosocial Stress"
 68. Vidhya Venugopal et al., "Heat Stress and Inadequate Sanitary Facilities at Workplaces – An Occupational Health Concern for Women?" *Global Health Action* 14, no. 9 (2016), doi:10.3402/gha.v9.31945.
 69. Sahoo et al., "Sanitation-Related Psychosocial Stress"
 70. Karanja, "Informal Settlements and a Relational View of Health in Nairobi, Kenya"
 71. Massey, "Insecurity and Shame Exploration"
 72. Karanja, "Informal Settlements and a Relational View of Health in Nairobi, Kenya"
 73. O'Reilly, "Combining Sanitation and Women's Participation in Water Supply"
 74. Ibid.
 75. Mark Gius and Ramesh Subramanian, "The Relationship between Inadequate Sanitation Facilities and the Economic Well-Being of Women in India," *Journal of Economics and Development Studies* 3, no. 1 (2015), doi:10.15640/jeds.v3n1a2.
 76. Miriam Hartmann et al., "Gender-Responsive Sanitation Solutions in Urban India," *RTI International Research Brief*, (February 11, 2015), doi:10.3768/rtipress.2015.rb.0009.1502.
 77. Marni Sommer et al., "Managing Menstruation in the Workplace: An Overlooked Issue in Low- and Middle-income Countries," *International Journal for Equity in Health* 15, no. 1 (2016), doi:10.1186/s12939-016-0379-8.
 78. Kathleen O'Reilly, "From Toilet Insecurity to Toilet Security"
 79. Tilley, "Sanitation in Developing Countries"
 80. Jewitt, "It's a Girl Thing"
 81. Marni Sommer et al., "Comfortably, Safely, and Without Shame: Defining Menstrual Hygiene Management as a Public Health Issue," *American Journal of Public Health* 105, no. 7 (2015), doi:10.2105/ajph.2014.302525.
 82. Marni Sommer et al., "Violence, Gender and WASH: Spurring Action on a Complex, Under-documented and Sensitive Topic," *Environment & Urbanization* 27, no. 1 (2014), doi:10.1177/0956247814564528.
 83. Marni Sommer et al., "Violence, Gender and WASH"
-

84. Jo De Berry et al., "Children of Kabul: Discussions with Afghan Families," *Save the Children*, July 2003, http://www.savethechildren.org/atf/cf/{9def2ebe-10ae-432c-9bd0-df91d2eba74a}/children_of_kabul.pdf [accessed on October 25, 2016].
85. Séverine Thys et al., "Why Latrines Are Not Used: Communities' Perceptions and Practices Regarding Latrines in a Taenia Solium Endemic Rural Area in Eastern Zambia," *PLoS Neglected Tropical Diseases* 9, no. 3 (2015), doi:10.1371/journal.pntd.0003570.
86. Marni Sommer et al., "Violence, Gender and WASH"
87. WaterAid, "1 in 3 Women Lack Access to Safe Toilets: A Briefing From Wateraid," 2012.
88. Hartmann et al., "Gender-Responsive Sanitation Solutions in Urban India"
89. Nisha Bala, "The 3 Biggest Reasons That India's Girls Drop Out of School," *American India Foundation* (blog), Summer 2014, <http://aif.org/the-3-biggest-reasons-that-indias-girls-drop-out-of-school/>.
90. Subhash B. Thakre et al., "Menstrual Hygiene: Knowledge and Practice among Adolescent School Girls of Saoner, Nagpur District." *Journal of Clinical and Diagnostic Research* 5, no. 5 (2011).
91. Paria Baishakhi, Agnihotri Bhattacharyya, and Sukes Das, "A Comparative Study on Menstrual Hygiene among Urban and Rural Adolescent Girls of West Bengal," *Journal of Family Medical Primary Care* 3, no. 4 (2014), doi:10.4103/2249-4863.148131.
92. Rose George, *Celebrating Womanhood: How Better Menstrual Hygiene Management Is the Path to Better Health, Dignity and Business*, Geneva: Water Supply & Sanitation Collaborative Council, 2013.
93. Jewitt, "It's a Girl Thing"
94. Tamiru et al., *Girls in Control*
95. Vatsalya and WaterAid, *A KAPB Study Report: Menstrual Hygiene & Management: An Issue Unnoticed...*, January-March 2012.
96. UNICEF, *Equity of Access to WASH in Schools: A Comparative Study of Policy and Service Delivery in Kyrgyzstan, Malawi, the Philippines, Timor-Leste, Uganda and Uzbekistan*, 2011.
97. Paul Montgomery et al., "Sanitary Pad Interventions for Girls' Education in Ghana: A Pilot Study," *PLoS ONE* 7, no. 10 (2012), doi:10.1371/journal.pone.0048274.
98. Leslie E. Greene, "Impact of a School-Based Hygiene Promotion and Sanitation Intervention on Pupil Hand Contamination in Western Kenya: A Cluster Randomized Trial," *American Journal of Tropical Medicine and Hygiene* 87, no. 3 (2012), doi:10.4269/ajtmh.2012.11-0633.
99. Jacquelyn Haver et al., *WASH in Schools Empowers Girls' Education in Masbate Province and Metro Manila, Philippines: An assessment of menstrual hygiene management in schools*, United Nations Children's Fund: New York, November 2013.
100. Bahadar Nawab et al., "Cultural Preferences in Designing Ecological Sanitation Systems in North West Frontier Province, Pakistan," *Journal of Environmental Psychology* 26, no. 3 (2006), doi:10.1016/j.jenvp.2006.07.005.
101. Tilley, "Sanitation in Developing Countries"
102. O'Reilly, "Combining Sanitation and Women's Participation in Water Supply"
103. Carolyn Hannan and Ingvar Andersson, "Gender Perspectives on Ecological Sanitation," *EcoSanRes*, 2002.
104. Gary Haq and Howard Cambridge, "Exploiting the Co-benefits of Ecological Sanitation," *Current Opinion in Environmental Sustainability* 4, no. 4 (2012), doi:10.1016/j.cosust.2012.09.002.
105. IRC and WaterAid, *Beyond Construction: Use By All, A Collection Of Case Studies From Sanitation And Hygiene Promotion Practitioners In South Asia*, 2008.
106. Japheth Kwiringira et al., "Gender Variations in Access, Choice to Use and Cleaning of Shared Latrines; Experiences from Kampala Slums, Uganda," *BMC Public Health* 14, no. 1 (2014), doi:10.1186/1471-2458-14-1180.
107. Note: CLTS is a community-wide behavior change approach that mobilizes communities to undertake their own appraisal and analysis of sanitation issues and take their own actions to become open defecation-free (ODF). CLTS was first introduced by WaterAid in 2007 and includes a three-pronged approach that seeks to trigger demand for sanitation (pre-triggering), (2) improve and encourage households to build toilets (triggering), and (3) handing over responsibilities for CLTS at the community level (post-triggering)
108. SSWM, "Community-Led Total Sanitation (CLTS)," 2008, <http://www.sswm.info/content/community-led-total-sanitation-clts> (accessed on April 29, 2017).
109. Jan Willem Roosenboom, interview with FSG (Ebele Anidi & Alexandra Geertz), May 2, 2017.
110. O'Reilly, "Combining Sanitation and Women's Participation in Water Supply"
111. Doss, "Intrahousehold Bargaining and Resource Allocation in Developing Countries"
112. Richards et al., "Going beyond the Surface"
113. Duflo, "Grandmothers and Granddaughters"
114. Kathleen O'Reilly, interview with FSG, October 26, 2016
115. Séverine Thys et al., "Why Latrines Are Not Used"
116. Nawab et al., "Cultural Preferences in Designing Ecological Sanitation Systems"
117. Tilley, "Sanitation in Developing Countries"
118. Séverine Thys et al., "Why Latrines Are Not Used"
119. Jay P. Graham, Mitsuaki Hirai, and Seung-Sup Kim, "An Analysis of Water Collection Labor among Women and Children in 24 Sub-Saharan African Countries," *PLOS ONE* 11, no. 6 (2016), doi:10.1371/journal.pone.0155981.
120. Tilley, "Sanitation in Developing Countries".
121. Nawab et al., "Cultural Preferences in Designing Ecological Sanitation Systems"
122. Tilley, "Sanitation in Developing Countries"
123. O'Reilly, "Combining Sanitation and Women's Participation in Water Supply"
124. Hannan, "Gender Perspectives on Ecological Sanitation"
125. Kwiringira et al., "Gender Variations in Access, Choice to Use and Cleaning of Shared Latrines"
126. Gary Haq and Howard Cambridge, "Exploiting the Co-benefits of Ecological Sanitation," *Current Opinion in Environmental Sustainability* 4, no. 4 (October 2012): 431-35. doi:10.1016/j.cosust.2012.09.002.

127. Practical Action, *Livelihoods and Gender in Sanitation, Hygiene and Water Services among the Urban Poor: Maili Saba Research Report*, 2005.
128. Bethany A. Caruso et al., "Assessing the Impact of a School-based Latrine Cleaning and Handwashing Program on Pupil Absence in Nyanza Province, Kenya: A Cluster-Randomized Trial," *Tropical Medicine & International Health* 19, no. 10 (2014), doi:10.1111/tmi.12360.
129. Alexandra Geertz et al., "Menstrual Health in India: Country Landscape Analysis," FSG, May 2016.
130. Hannan, "Gender Perspectives on Ecological Sanitation"
131. Parimita Routray et al., "Socio-Cultural and Behavioural Factors Constraining Latrine Adoption in Rural Coastal Odisha: An Exploratory Qualitative Study," *BMC Public Health* 15, no. 1 (2015), doi:10.1186/s12889-015-2206-3.
132. Jason Corburn and Chantal Hildebrand, "Slum Sanitation and the Social Determinants of Women's Health in Nairobi, Kenya," *Journal of Environmental and Public Health* 2015 (2015), doi:10.1155/2015/209505.
133. John Bosco Isunju et al., "Financing of Sanitation Services in the Slums of Kampala and Dar es Salaam," *Health* 5, no. 4 (2013) doi:10.4236/health.2013.54104.
134. Zachary Burt, Kara Nelson, and Isha Ray, "Towards Gender Equality Through Sanitation Access," UN Women Discussion Paper Series, no. 12 (March 2016).
135. Hartmann et al., "Gender-Responsive Sanitation Solutions in Urban India"
136. Hannan, "Gender Perspectives on Ecological Sanitation"
137. Irene Daneklman et al., "Making Sustainable Sanitation Work For Women And Men: Integrating A Gender Perspective Into Sanitation Initiatives," *Women in Europe for a Common Future*, 2009.
138. Nawab et al., "Cultural Preferences in Designing Ecological Sanitation Systems"
139. O'Reilly, "Combining Sanitation and Women's Participation in Water Supply"
140. Asian Development Bank, *Balancing the Burden? Desk Review of Women's Time Poverty and Infrastructure in Asia and the Pacific*, 2015.
141. Kilsby, "Now We Feel Like Respected Adults"
142. Zarina Ishani and Davinder Lambda, "Urban Community Waste Management," *Habitat International Coalition*, 2012.
143. Kushal Seetharam, "Challenges and Opportunities for Sanitation in Developing Countries," *Journal of Science Policy & Governance* 7, no. 1 (2015).
144. Zachary Burt, Kara Nelson, and Isha Ray, "Towards Gender Equality Through Sanitation Access," UN Women Discussion Paper Series, no. 12 (2016).
145. Hartmann et al., "Gender-Responsive Sanitation Solutions in Urban India"
146. Kwiringira et al., "Gender Variations in Access, Choice to Use and Cleaning of Shared Latrines"
147. Isha Ray, interview with FSG, October 5, 2016.
148. Kwiringira et al., "Gender Variations in Access, Choice to Use and Cleaning of Shared Latrines"
149. Isunju et al., "Financing of Sanitation Services in the Slums of Kampala and Dar Es Salaam"
150. Isha Ray, interview with FSG, October 5, 2016.
151. Jamwal, Nidhi. "Why Are We Pretending That There Isn't a Growing Mountain of Menstrual Waste We Need to Deal With?" *Yahoo News India*, <https://in.news.yahoo.com/why-are-we-pretending-that-there-isn-t-a-growing-mountain-of-menstrual-waste-we-need-to-deal-with-111659074.html> (accessed on January 9, 2015).
152. Arpita Bhagat, interview with FSG, December 10, 2015.
153. Marni Sommer, Marianne Kjellén, and Chibesa Pensulo, "Girls' and Women's Unmet Needs for Menstrual Hygiene Management (MHM): The Interactions Between MHM and Sanitation Systems in Low-Income Countries," *Journal of Water, Sanitation and Hygiene for Development* 3, no. 3 (2013).
154. Marianne Kjellén et al., "Global Review of Sanitation System Trends and Interactions with Menstrual Management Practices," *Stockholm Environment Institute*, 2012.
155. Ibid.
156. Ibid.
157. WSSCC et al., *For Her It's the Big Issue*, 2006.
158. Bill & Melinda Gates Foundation, *Water, Sanitation & Hygiene: Strategy Overview*, <http://www.gatesfoundation.org/What-We-Do/Global-Development/Water-Sanitation-and-Hygiene>.
159. RTI, *RTI Reinvent the Toilet September and October 2015 User Studies: Ahmedabad*, India Summary Field Report.
160. Carl Hensman, Senior Program Officer, Water, Sanitation, & Hygiene, the Bill & Melinda Gates Foundation, Interview with FSG, June 11, 2017.
161. J. Willetts, J. Murta, and A. Gero, "Water and Sanitation Entrepreneurs in Indonesia, Vietnam and Timor-Leste: Traits, Drivers and Challenges," *Working Paper*, no. 4, Institute for Sustainable Futures, University of Technology: Sydney, 2016.
162. Mesfin Tilaye and Meine Pieter Van Dijk, "Private Sector Participation in Solid Waste Collection in Addis Ababa (Ethiopia) by Involving Micro-enterprises," *Waste Management & Research* 32, no. 1 (2013), doi:10.1177/0734242x13513826.
163. World Health Organization, "UN-Water Global Annual Assessment of Sanitation and Drinking-Water: The Challenge of Extending and Sustaining Services," *GLAAS Report*, 2012.
164. Government of India Ministry of Women and Child Development, *National Policy for Women 2016: Articulating a Vision for Empowerment of Women*, May 2016.
165. Water and Sanitation Program, "Mainstreaming Gender in Water and Sanitation: Gender in Water and Sanitation," *Working Paper*, 2010.
166. Inga T. Winkler and Virginia Roaf, "Taking the Bloody Linen out of the Closet: Menstrual Hygiene as a Priority for Achieving Gender Equality," *Cardozo Journal of Law & Gender* 21, no. 1 (2015).
167. Clara Greed, "Taking Women's Bodily Functions into Account in Urban Planning and Policy: Public Toilets and Menstruation," *Town Planning Review* 87, no. 5 (2016), doi:10.3828/tp.2016.35.
168. "Menstrual Hygiene," *Wash in Schools Mapping*, <http://washinschoolsmapping.com/menstrual-hygiene.html> (accessed on January 20, 2016).
169. UNICEF, "MHM in Ten: Advancing the MHM Agenda in WASH in Schools," http://www.unicef.org/wash/schools/files/MHM_in_Ten_2014_Meeting_Report.pdf (accessed on October 30, 2014)
170. UN Women, *Abolishing Chhaupadi, Breaking the Stigma of Menstruation in Rural Nepal*, 2017.
171. UN Women, "The Joint Programme on Gender, Hygiene and Sanitation," *Newsletter* no. 4 (2014).

-
172. Gyana Ranjan Panda and Trisha Agarwala, "Gender Responsive Budget Analysis in Water and Sanitation Services in the Resettlement Colonies of Delhi," *SSRN Electronic Journal*, doi:10.2139/ssrn.2119016.
173. WaterAid Uganda and Uganda Water and Sanitation NGO Network, "Mainstreaming Gender in Sanitation and Hygiene in Uganda," [presentation, Sanitation and Hygiene Conference, South Africa, July 29-Aug 1, 2002].
174. Sommer et al., "Managing Menstruation in the Workplace"
175. Kathleen O'Reilly, "Combining Sanitation and Women's Participation in Water Supply: An Example from Rajasthan," *Development in Practice* 20, no. 1 (2010) accessed February 2010, doi:10.1080/09614520903436976.
176. Water and Sanitation Program, "Mainstreaming Gender in Water and Sanitation: Gender in Water and Sanitation," *Working Paper*, 2010.
177. Duflo, "Grandmothers and Granddaughters".
178. Raghavendra Chattopadhyay and Esther Duflo, "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India," *Econometrica* 72, no. 5 (2004), doi:10.1111/j.1468-0262.2004.00539.x 1409-1443.
179. Nelson Ekane et al., "Comparative Assessment of Sanitation and Hygiene Policies and Institutional Frameworks in Rwanda, Uganda and Tanzania," *Working Paper*, no. 2016-05, Stockholm Environment Institute: Stockholm, 2016.
180. World Health Organization, "UN-Water Global Annual Assessment of Sanitation and Drinking-Water: The Challenge of Extending and Sustaining Services," *GLAAS Report*, 2012.
181. Mukami Kartuki et al., "Better Water and Sanitation for the Urban Poor: Good Practice from sub-Saharan Africa," *Water Utility Partnership for Capacity Building AFRICA*, 2003.
182. Daneklman et al., "Making Sustainable Sanitation Work for Women and Men"
183. Y. Awunyo-Akaba et al., "Sanitation Investments in Ghana: An Ethnographic Investigation of the Role of Tenure Security, Land Ownership and Livelihoods," *BMC Public Health* 16, no. 1 (2016), doi:10.1186/s12889-016-3283-7.
184. Sida, "Methods and Tools: Gender Tool Box," <http://www.sida.se/English/partners/resources-for-all-partners/methodological-materials/gender-tool-box/>.
185. World Bank PPPIRC Sector-Specific Gender Tools: [http://ppp.worldbank.org/public-private-partnership/ppp-sector/gender-impacts-ppps/mainstreaming-gender-sector-specific-materials/water/mainstreaming-ge#PPP Gender Water Guidelines](http://ppp.worldbank.org/public-private-partnership/ppp-sector/gender-impacts-ppps/mainstreaming-gender-sector-specific-materials/water/mainstreaming-ge#PPP%20Gender%20Water%20Guidelines)
186. Plan International, "Gender and WASH Monitoring Tool," 2014, <https://www.plan.org.au/~media/plan/documents/resources/gwmt-march-2014.pdf>.
187. Jane Wilbur (WaterAid), interview with FSG, October 11, 2016
188. UN Women, "SDG 6: Ensure Availability and Sustainable Management of Water and Sanitation for All," <http://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-6-clean-water-sanitation>, [accessed May 19, 2017]
189. Archana Patkar (WaterAid), interview with FSG, October 5, 2016
190. Andy Bastable and Lucy Russell, "Gap Analysis in Emergency Situations: Water, Sanitation and Hygiene Promotion," Humanitarian Innovation Fund, July 2013.
191. Judy A. Benjamin, "Issues of Power and Empower in Refugees Studies: Rwandan Women's Adaptive Behaviour at Benaco Refugee Camp," *Refuge* 17(4), October 1998.
192. Michael Ashley Stein and Janet E. Lord, "Human rights and humanitarian assistance for refugees and internally displaced persons with disabilities in Africa," *Aspects of disability law in Africa*, Pretoria, South Africa: Pretoria University Law Press, 2011.
193. B. Byrne and S. Baden, "Gender, emergencies and humanitarian assistance," BRIDGE Report No. 33, BRIDGE, IDS, Brighton, 1995.
194. Jo Spangaro et al, "What is the evidence of the impact of initiatives to reduce risk and incidence of sexual violence in conflict and post-conflict zones and other humanitarian crises in lower- and middle-income countries? A systematic review," London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London, 2013.
195. Ryoa Chung, "A Theoretical Framework for a Comprehensive Approach to Medical Humanitarianism," *Public Health Ethics*, 2012.
196. The Sphere Project, "The Sphere Handbook," Accessed November 15, 2016, <http://www.sphereproject.org/handbook/>
197. Marni Sommer, "Menstrual hygiene management in humanitarian emergencies: Gaps and recommendations," *Waterline* 31, Nos. 1&2 (January 2012).
198. Marni Sommer, "Menstrual hygiene management in humanitarian emergencies: Gaps and recommendations," *Waterline* 31, Nos. 1&2 (January 2012).
199. Marni Sommer, "Menstrual hygiene management in humanitarian emergencies: Gaps and recommendations," *Waterline* 31, Nos. 1&2 (January 2012).
200. Jamila Nawaz et al, "Oxfam experience of providing screened toilet, bathing and menstruation units in its earthquake response in Pakistan," *Gender & Development* 18, No. 1 (2010), 81-86, doi:10.1080/13552071003600067.
201. Marni Sommer, "Menstrual hygiene management in humanitarian emergencies: Gaps and recommendations," *Waterline* 31, Nos. 1&2 (January 2012).
202. Sneha Krishnan and John Twigg, "Menstrual hygiene: a 'silent' need during disaster recovery," *Waterlines* 35(3), July 2016.
203. Jamila Nawaz et al, "Oxfam experience of providing screened toilet, bathing and menstruation units in its earthquake response in Pakistan," *Gender & Development* 18, No. 1 (2010), 81-86, doi:10.1080/13552071003600067.
204. Alice Robinson and Alice Obrecht, "Improving menstrual hygiene management in emergencies: IFRC's MHM kit," HIF/ALNAP Case Study, London: ODI/ALNAP, 2016.
-

BILL & MELINDA
GATES *foundation*